



## SEQUENCE LISTING

<110> Melis, Anastasios  
Wintz, Hsu-Ching Chen

<120> MODULATION OF SULFATE PERMEASE FOR  
PHOTOSYNTHETIC HYDROGEN PRODUCTION

<130> BERK-016CIP

<140> 10/762,769  
<141> 2004-01-21

<150> 60/354,760  
<151> 2002-02-04

<150> 60/377,902  
<151> 2002-05-02

<150> 10/350,298  
<151> 2003-01-22

<160> 16

<170> FastSEQ for Windows Version 4.0

<210> 1  
<211> 411  
<212> PRT  
<213> Chlamydomonas reinhardtii

<400> 1  
Met Glu Arg Val Cys Ser His Gln Leu Ala Ser Ser Arg Gly Arg Pro  
1 5 10 15  
Cys Ile Ala Gly Val Gln Arg Ser Pro Ile Arg Leu Gly Thr Ser Ser  
20 25 30  
Val Ala His Val Gln Val Ser Pro Ala Gly Leu Gly Arg Tyr Gln Arg  
35 40 45  
Gln Arg Leu Gln Val Val Ala Ser Ala Ala Ala Ala Ala Phe Asp  
50 55 60  
Pro Pro Gly Gly Val Ser Ala Gly Phe Ser Gln Pro Gln Gln Gln Leu  
65 70 75 80  
Pro Gln Gln His Pro Arg Gln Pro Gln Ala Val Ala Glu Val Ala Val  
85 90 95  
Ala Glu Ser Val Ser Ala Pro Ala Ser Ala Ala Pro Ser Asn Asp Gly  
100 105 110  
Ser Pro Thr Ala Ser Met Asp Gly Gly Pro Ser Ser Gly Leu Ser Ala  
115 120 125  
Val Pro Ala Ala Ala Thr Ala Thr Asp Leu Phe Ser Ala Ala Ala Arg  
130 135 140  
Leu Arg Leu Pro Asn Leu Ser Pro Ile Ile Thr Trp Thr Phe Met Leu  
145 150 155 160  
Ser Tyr Met Ala Phe Met Leu Ile Met Pro Ile Thr Ala Leu Leu Gln  
165 170 175  
Lys Ala Ser Leu Val Pro Leu Asn Val Phe Ile Ala Arg Ala Thr Glu  
180 185 190  
Pro Val Ala Met His Ala Tyr Tyr Val Thr Phe Ser Cys Ser Leu Ile  
195 200 205  
Ala Ala Ala Ile Asn Cys Val Phe Gly Phe Val Leu Ala Trp Val Leu

210	215	220
Val	Arg	Tyr Asn Phe Ala Gly Lys Lys Ile Leu Asp Ala Ala Val Asp
225	230	235 240
Leu	Pro Phe Ala Leu Pro Thr Ser Val Ala Gly Leu Thr Leu Ala Thr	245 250 255
Val	Tyr Gly Asp Glu Phe Phe Ile Gly Gln Phe Leu Gln Ala Gln Gly	260 265 270
Val	Gln Val Val Phe Thr Arg Leu Gly Val Val Ile Ala Met Ile Phe	275 280 285
Val	Ser Phe Pro Phe Val Val Arg Thr Met Gln Pro Val Met Gln Glu	290 295 300
Ile	Gln Lys Glu Met Glu Glu Ala Ala Trp Ser Leu Gly Ala Ser Gln	305 310 315 320
Trp	Arg Thr Phe Thr Asp Val Val Leu Pro Pro Leu Leu Pro Ala Leu	325 330 335
Leu	Thr Gly Thr Ala Leu Ala Phe Ser Arg Ala Leu Gly Glu Phe Gly	340 345 350
Ser	Ile Val Ile Val Ser Ser Asn Phe Ala Phe Lys Asp Leu Ile Ala	355 360 365
Pro	Val Leu Ile Phe Gln Cys Leu Glu Gln Tyr Asp Tyr Val Gly Ala	370 375 380
Thr	Val Ile Gly Thr Val Leu Leu Leu Ile Ser Leu Val Met Met Leu	385 390 395 400
Ala	Val Asn Gln Leu Gln Lys Leu Ala Arg Lys	405 410

<210> 2  
 <211> 3873  
 <212> DNA  
 <213> Chlamydomonas reinhardtii

<400> 2  
 gcttagtacc taagcaaaaa taccaaagcc ttatcctgag ttgtcaacaa gaactccagc 60  
 ctgcgacgat gcaaaggctt tcttgagcgg gttgatggac tttgctttgt tatctgtcca 120  
 gtaagccacc agacactacc aagttagagta atccattttgt ataggtagac agatatggagc 180  
 gagtttgcag ccatcagctt gcctcgctgc gagggaggcc atgcacatcgct ggggtgcagc 240  
 ggtcgcccatt ccgacttaggg acttcaagcg ttgctcatgt gcagggctct ccggcaggtta 300  
 agcaccgcgc tcggcggcgt gtacacatgg ggccgtcagg ccaactgcgt ttgttggcta 360  
 tgcaaccgaa acaggccttgg gagatatac acggcaaaga ctgcaagtgc tggcgtctgc 420  
 agctgcggca gcccgtttcg accctcttgg aggtgcgtgg cgtgagggtc gcacgggtgc 480  
 gggttggcct gaaaaccaag cctcggcacg actacactgca acagcattgc ccgcattctcc 540  
 agccccctcac cctcgagtc ctcccaaga cctctatccc ctgcgcattca ttggttcgaa 600  
 ggccgcgcctt gccggccttgg ggcgtggct acgctgaccc cacggcacga cttggcacgg 660  
 cctggcgcgg cctgagcggc cccccccttc ctgatggccc cacgtttgc cgcccacgcc 720  
 gctccccca ggtgtctccg ccgggttctc gcagccgc当地 cagcagtc当地 cacaacagca 780  
 cccacgc当地 ccacaggcgg tggcggaggt agctgtc当地 gagtcagtc当地 cggcgc当地 840  
 ttctgc当地 cc当地 ccaatg atggctc当地 cacggc当地 atggacggc当地 gccccagctc 900  
 cggc当地 ctc当地 gccgtgccc当地 cc当地 cccacccac cgttctccg cc当地 cggc当地 cgc当地 960  
 cctccgc当地 cccaaacctct cccccc当地 catc当地 cacctggacc ttcatgctct cctacatggc 1020  
 cttcatgctc atcatgccc当地 tcaccgc当地 gtc当地 caaaaaa gcctcgctcg tgccgctcaa 1080  
 cgttctcatc ggc当地 cgc当地 ccc当地 cggagccggt ggc当地 gatgc当地 acgc当地 gc当地 ctactacgc tc当地 accttctc 1140  
 ctgctcgctg atgc当地 cggc当地 ccatcaactg cgttgc当地 ttc当地 ctgc当地 tggc当地 gtgc当地 1200  
 ggtgc当地 ctac aatttgc当地 gga当地 aagat cctggacgc当地 gc当地 ggtggacc tgccgctc当地 1260  
 gctgccgacc tc当地 gggtggc当地 gc当地 ctgc当地 acgc当地 ct当地 gggtggct tacggc当地 acgc当地 agttcttc当地 1320  
 cggccagttc ctgc当地 caggc当地 agggc当地 gtgc当地 ggtgc当地 gtgc当地 tatagc当地 tagtgc当地 1380  
 ttagcagctg ggggtccggc agtagtccc gccctagta ggtc当地 gaaact ataccagaag 1440  
 aagaggacga acatggggct atccagcaag ctc当地 gctctagg gaaggaggag tttgggagaa 1500  
 cggc当地 ggggcttgg gggacgc当地 agatgc当地 acgc当地 gc当地 gggtggagg gaaggtaag gc当地 gggaggaa 1560  
 gatggtagca cggggc当地 ttgg gggacgc当地 agatgc当地 acgc当地 gc当地 gggtggatg ggaaggatg 1620  
 gggaaagc当地 ga gctggggaca gtgc当地 aagagc当地 cc当地 gggaggaga gggaaagttt gactc当地 aggaa 1680

ggggggctag	agaggggcat	gcggactcct	gctgggattt	aggtcgtgc	tcattgagga	1740
gcccttgaa	tcacgccgacg	gaaacgtggc	cgacggggtc	tgccgagcac	accaggctag	1800
ctagacgcgc	ggttggcaa	cgagcagagc	tgctgtgcgg	ctatggatgg	aaggcgtatgc	1860
agcgagcatg	tgcagtgaac	attggttga	ggacagggga	ctccgaggtt	gcataggcgg	1920
gccgccactg	tctctgccgc	tagggtgact	agtcgcctcg	aacctggcgg	tggccccata	1980
cccgcatgtt	gaggatgctc	cacgcgttc	agcttgccat	gtctgggtc	tggtctgga	2040
cgcaatcagc	gtgtgagggt	ccaactctat	atgaaattat	ggataccctc	caactaccag	2100
cacgttaggct	gccggAACG	ggctgaagcg	gctggcctgc	cccctcatcc	tctcggttccc	2160
ctgtttttgt	ccctgtcca	cccaggtgg	gttcacgcgg	ctgggtgtgg	tgatcgccat	2220
gatcttcgtg	tccttccct	tcgtggcg	caccatgcag	cccgcatgc	aggtgagagc	2280
gcccaggagg	cggagccatg	gccccgttgg	gccccgttgg	gccccgttgg	gcggggcgcg	2340
gatggggcgg	cttggggagt	aatgtgggc	ggatgggtgt	gcagcctggc	agggtatggg	2400
agcgagagga	tagcggggac	aggggacagg	gaagggaaagg	gaaggggaag	gatgccatat	2460
gcgagcaaag	gggttatggg	aaccggcggt	tggggctggg	agcgcggga	gcagggaggg	2520
agtgcacgg	acgggggcaa	ggcggacagg	gtgagggagg	gtcaggccg	gactggatg	2580
ggtcatgtgt	cctggtcggg	ggtgtagccg	tgggaggcgg	gcaggcagcg	tgtgttctgg	2640
cacggtgttt	tggcgaaaaga	taccacggca	tgttatgggg	ccagttggc	agggaaagaac	2700
cgttggacac	gacttcgttg	acagatctag	ttcattgcac	ccgggtcgca	ccaagggtgg	2760
cggcgagccc	ggcccgccac	gtccgagta	cccgagccg	taacccgc	acccgcctt	2820
ttgcgcctt	tccctgtcc	cctgtccgc	ataccgtgca	ccatgcctc	tgccgccttcc	2880
tcagggccctc	aggccctcac	ctccccctca	cctcctccta	acgccttccc	ctgccttcc	2940
cttccctcc	caacgcccacc	acgtgcaaca	ggaaatccaa	aaggagatgg	aggaggcgc	3000
atggtcgtcg	gggcgcctcg	agtggcgcac	cttcacagac	gtgggtctgc	cgccgcgtgc	3060
gccccgcgtg	ctgaccggca	cggcactggc	cttctcgccg	gcccgtggc	agttcggatc	3120
cattgtcatc	gtgtcctcca	actttgcctt	caaggacctg	atcgcgccttgc	tgctgatctt	3180
ccagtcgtcg	gagcagtacg	actacgtggg	cgccaccgtg	atcggcacag	tactgcttt	3240
gatttcgtcg	gtgtatgtgt	tggcggtgaa	ccagctgcag	aagctggcgc	gcaagtgagg	3300
ggctgaggcg	tttgaggaga	gtgggcgtct	gcccggggcgc	ttgtggcgca	ggggcaggtg	3360
gaggagggtt	cagggtgagg	caggagtggc	agttgggtgg	gggtgcaggg	ccccgtgttg	3420
ggatgggatg	ggatgggacc	gtggggagggg	tggactttt	gtgggggtgg	agttgggtgt	3480
acgtatttagg	atatgggagg	tggtatgcag	ttaaaggggg	gggtggcaat	ctggacgggg	3540
actcaacttt	tactaggcac	gcatgtcgca	ggagtggata	tcgatgggtt	tggggatgtc	3600
agcacgcctt	gcttgagttt	ggccatggga	cccgggacta	ggcttggttt	cgagccgagc	3660
cagtcaccag	ggagacgtac	gagcgcacac	agtgattac	gggattgtt	aggcggcga	3720
ttgacgcaaa	tccacggggg	ctgtggctt	ggggaggcag	ggatttgagc	aaggacgcac	3780
tgcaagctca	ggcagtcgc	tgcccgttacc	ctgttctgg	tccagtg	tggttgg	3840
ggcaatcgtg	gtcctttgca	attcatggcg	cgc			3873

<210> 3  
<211> 1984  
<212> DNA  
<213> Chla

```

<400> 3
gcttagtacc taagcaaaaa taccaaagcc ttatcctgag ttgtcaacaa gaactccagc 60
ctgcgacgat gcaaaggctt tcttgagcgg gttgatggac tttgcttgc tatctgtcca 120
gtaagccacc agacactacc aagttagagta atccattttgt ataggtagac aatatggagc 180
gagttgcag ccatcagctt gcctcgtcgc gagggaggcc atgcacgcgat ggggtgcagc 240
ggtcgccccat ccgactaggg acttcaagcg ttgctcatgt gcaggctct ccggcaggcc 300
ttgggagata tcaacggcaa agactgcaag tcgtggcgtc tgcaagtcgc gcagcggcct 360
tcgaccctcc tggaggtgtc tccgccccgt ttcgcagcc gcaacagcag ctgccacaaac 420
agcacccacg ccaaccacag gcggtggcg aggtagctgt cgccgagtca gtctcgccgc 480
ccgcttctgc ggccgcctcc aatgatggct cgcccacggc ctccatggac ggcggcccc 540
gctccggcct cagcggccgtg cccggcccg ccacccgcac cgaccttcc tccgcccgg 600
cgccgcctccg cctgccccaa ctctccccca tcacccatcg gacccatcg ctctccatcaca 660
tggccttcat gctcatcatg cccatcaccg cgctgctgca aaaaggctcg ctctcgccgc 720
tcaacgtttt catcgccgcg gccaccggac cggtggcgat gcacgcctac tacgtcacct 780
tctccgtctc gctgatcgcg gccgccatca actgcgttgt tggctcgat ctggcctggg 840
tgctggcgcg ctacaatttc gccccggaaa agatccctgga cgccggcgat gacccatcg 900
tcgcgctgcc gacccgtgtc gccccgcctca cgcttgcac ggtgtacggc gacgagttct 960
tcatcqgcca qttccctgcg ggcgaggccg tgccagggtgtt gttcacgcgg ctgggtgtgg 1020

```

tgatccccat gatcttcgtg tccttccct tcgtggcgcg caccatgcag cccgtcatgc 1080  
 agggaaatcca aaaggagatg gaggaggcgg catggtcgtc gggccctcg cagtggcgca 1140  
 cttcacaga cgtggtgctg ccggccgtgc tgcccgcgt gctgaccggc acggcaactgg 1200  
 cttctcgcg cgccgttggc gagttcgat ccattgtcat cgtgtcctcc aactttgcct 1260  
 tcaaggaccc gatcgccccc gtgctgatct tccagtgcct ggagcagttac gactacgtgg 1320  
 gcccaccgt gatcgccaca gtactgctgt tgatttcgt ggtgatgtat ttggccggta 1380  
 accagctgca gaagctggcg cgcaagttag gggctgaggc gtttggagg agtggggcg 1440  
 tgcggaggcg ctgtggcgc agggcaggt ggaggaggt gcagggtgag gcaggagttgg 1500  
 caggtggtgg agggtcagg gcgggggttt gggatggat gggatggac cgtggggagg 1560  
 gtgggacttt ggggggtgg gagtgggtgc tacgtattag gatatggag gtggtatgca 1620  
 gttgaagggg ggggtggcaa tctggacggg gactcaactgt ttactaggca cgcacgtcgc 1680  
 aggagttggat atcgatgggt gtggggatgt cagcacgtt ggcttgagtt gggccatggg 1740  
 acccgggact agcttgggt gcgagccgag ccagtcacca gggagacgta cgagcgcaca 1800  
 cagtattac ggggattgtat taggccccaa attgacgcaa atccacgggg gctgtggctt 1860  
 gggggaggca gggattgagc gaaggacgca ctgcaagctc aggcaactgc atgcccgtac 1920  
 cctgttctg gtccagtgtg gagacaagac tggcaatctt ggtccttgc aattcatggc 1980  
 gcgc 1984

<210> 4  
 <211> 1863  
 <212> DNA  
 <213> Chlamydomonas reinhardtii

<400> 4

cattcaattt gcagcggttcc taaaatggca agcacaacgc tgctccagcc cgcgttgg 60  
 ctggccctcg ggttagggcc tcgctccct ctgtcgcttc caaaaattcc tcgcgtgtc 120  
 acgcacacta gtgctccctc tacctcaaag tactgcact catcatcaat tataagagac 180  
 acgctaggcc gggaaacatc ggttgcggg agaccatggc ttgcaccccg gcctgcgcct 240  
 caacaagcc gaggcgaccc actggctcc aaatcggggg cagcaggagg catgggcgc 300  
 catggagggg gcttagggga accggtcgt aattggatca agaagctact cggtgggtc 360  
 gcggcgcgt acatcggtt ggtcgctg gtgccttcc tgaatgtctt cgtccaggcg 420  
 ttcgccaagg gcatcattcc cttccctggag cactgcgcgg accccgactt tctgcacgca 480  
 ctcaagatga cgctgtatcc ggcgttcgtg acgggtccgc tcaacacggt gtttggcacg 540  
 gtggccgcga tcaacctcac gcgcacacgat ttccccggca aggtgttccct gatgtcgctg 600  
 ctggacactgc ctttctccat ctcgcccgtg gtgactggcc tgaatgtcac gctgtgtac 660  
 ggccgcaccc gctgggtcgc ggcgtcgtg cgggagaccc gcatcaacgt ggtgttcgca 720  
 ttcacgggca tggccctggc caccatgttt gtgacgctgc cggtcggtt ggcgcagctg 780  
 atccccatcc tgagaaacat ggacctgtcg caggaggagg cggcggaaac gctgggggcc 840  
 aacgactggc agtgttctg gaacgtgacg ctgcccacca tccgctgggg cctgctgtac 900  
 ggcgtatcc tggcaacgc ccgagccatg ggcgtatcc gaggcgtgtc cgtcatctcg 960  
 ggcaacatca tcggccgcac gcagacgtcg acgctgttcg tcgagtcgc ctacaaggag 1020  
 tacaacacgg agcggcggtt cgcggcgct gtgctgtcg gcgcgttgc gctgggcacc 1080  
 ctgtggatca aggacaaggat ggaggaggcg gcccggccgg agagccgaa gtagagagga 1140  
 gcaggcggcg tcggcagcgg cggcagttgc agcggcagcg gcccggagcg gcagctggag 1200  
 aggagcaggc ggtggcggcg gaggcggga aatagagagg tgcagcaagg aggcaaggcg 1260  
 cgacgcgagg ggagggcggt ggtggggct tgcgtgggtt ctgggtccgt gcccagggtg 1320  
 cttggcttgg gtatgtgggt tgggggtt gctgattccct gtttgggtga gcccggccg 1380  
 ttcctgaagg aagcaaggaa ggacagtgcg gcagtgacca gcccggtaatg gtaagggagc 1440  
 tgacacgtgt ggcgttctgt tgctgtcg cgcacgttca acgcacgcgg agcagcttct 1500  
 ctgtctgtatc tctaacgggg ggcgttgcgt ctgataatag acggaggccg aaggagcag 1560  
 ggcgttca gatggggtaa aagctgtgg aatcaacac gtgcacgcgg tgggttgcatt 1620  
 ttgtgtatcc tggacgttct gagggttccg tggccctata ggcgtgtcg tgcataatata 1680  
 cgcgcggccgg cgcataaaaac atgactgcatt gtgtcggtt gtcacgtaca gttatgcgt 1740  
 gccccgtttt acaagcggga tagaggcaca ctccacgtat tatgcattga gcccagtaga 1800  
 ctctggtcag aaggccggta aatttacatg tgcgtgggtt aaccctgtaa gtcacgtggcc 1860  
 aag 1863

<210> 5  
 <211> 2253  
 <212> DNA  
 <213> Chlamydomonas reinhardtii

<400> 5

gtacttcaat tgtcagaatg gcgtcgctgc tcgctcaaac aacatcgccg cttggcgctc 60  
gcccagctgc gcaagctggc cctgtcgccc aaatggcacc gatggcaagc cgagtgcagc 120  
cggcgatgcc tagcgcgctg ctccccactgc acgcccagagc gacaacaact tcagtcgctt 180  
gccggcagc cagcatcgac aaacctgtcg tttacactcc tcgagattcg tcgcaacagt 240  
cctccaatgg ggaggagaa gtgtccatgt ccatatcatc catggacgag gttggaccct 300  
cttatgaggg aatcattaca gacgcgccta cacgaccaac ggggctttat gtgcgggtgc 360  
gcaacatggt gaagcacttc agcaccgcca aaggcctgtt cagggcggtg gacggcgtgg 420  
acgtggacat cgagcccagc tccatcgctgg cgctgctggg gcccagcggc agcggcaaga 480  
ccacattgct ggcgcctcatt gcaggcctgg agcagccac gggcgcaac atctacttg 540  
acgacacgga cgcgaccaac ctgtccgtcc aggaccgcca gatcggttc tggttccaga 600  
gctatgcgt gttaaccac aagacagttt cgagaaacat caagtttga ctggaggtgc 660  
gcaagctcaa catcgaccac gacaagcgcg tggcgagct gctggcgtg gtgcagctca 720  
ccggcctggg cgaccgctac ccgcgcacaa tgtcggcgcc ccagcgccag cgtgtggcgc 780  
tggcgcgcc cctggcctcc aaccccgccg tcgtgtctgtt ggacgagccc ttggcgccgc 840  
tggacgcgtt ggtgcgcaag cagctgcga cggggctgcg cgagatcgtg cgcagcgtgg 900  
gcgtgaccac catcattgtg acgcacgacc aggaggaggc gtgcacactg gcgacaaagg 960  
tgtgtgtt caacaggggc ctggtgagc agcagggcag cccaccgag atcatcaagc 1020  
ggccgcgcac gcccttcatt atgaagttcg tggcgagac caacgtgtt ccggccacgt 1080  
cgctgctggc caagcgcata cgcttcaaca cctccaagac cagcgtcatg ttccggccgc 1140  
acgacattaa gctgttcaag acggtgccgc cggagagcgg cgaggccgcg ctgaccacgg 1200  
tggcgccaa cgtggcgac aaagccaacc tgggtgggt ggtcaagtac acgctgcgt 1260  
tcgatgacga cgtggagtgc gagctgcagc tcagccgcga ccaggacgag cgcgagtaca 1320  
acctgggtt gggcagccgc gtgttcgtgc acgtgcgcga ccgcaccatg atgggcttca 1380  
acgcccacgca cgtggacacg acgeccatcg tgtaatgtgc ggggttggcg gctgtggcca 1440  
gcgattttt caatgcagtc cagcgtgtc ttgggttggt tccagtgtaca cccatccagg 1500  
gcacaggtcc ctgagcagcg ggtgttggt atgggttggta gcagttgtac ccgattctcg 1560  
catgcaaggg ggcggggcgc ccacgggtt ggagagcggg atggcggtga ggtggctac 1620  
tgcacatgcggc cgtggaggaa cggagggtt cacaggcggg cagtagaca ggcggagcgg 1680  
gctgggtgag cggggctgtt gttttgggtt ggaggccgtg cagactgggtt gggataactga 1740  
cagatcaatg agcggcgctc gctccatggg tcatgttggag agcgggttgg gtgtgtgcag 1800  
ttgcgagttc tgagcgttgc tgccctcgcc gctgtgtgcg cgcgcctcg cgtctgcggg 1860  
cgctgtcgga gacgggcgtt gtacatgaag ctggacacttgc gcctgtctca caaatatccc 1920  
ttatgttaat attaggtgtt cgcacatgtt cttggagacc cacctgtatgtt gtgtgtcaca 1980  
gggtggcagta gttggcctt gggggaggta gcacgtctt catgagatgt cgtgtgcgt 2040  
accgccttta cattgccaat cacgtggaa ggtgaaacca tgcacatgtc gtgcataatc 2100  
gagatgcaga cggcggattt ctgccaaaat gttctgttgc tgggtgtgcag acttgggtgc 2160  
gaaggggcca ggcggccagg ggtatgtgc gtgccaaggaa gctgcgtccg ccacgagtga 2220  
ccagcggaaac ttgttaattt aatattgtat cct 2253

<210> 6  
<211> 1853  
<212> DNA  
<213> Chlamydomonas reinhardtii

<400> 6

gggcagcgta taagtaatgt cgttcttggc tcccagctta ggcgtcgccg gggggattct 60  
ggagccggcg agtgcagcga ggccgcctgc gcacgcggcc ggtcacgcac ccgttctaaac 120  
aagcgatagg actgggtggac ctggccgtt tcatgtacagg cctggcggtt ctccccagccc 180  
ccatgcggcg tcgttgacgc cctccagcgag cgggcaagca agccagcaag ggcgcacccca 240  
gcgcgtcgac caccagcaag cgcagcgccaa ggaccagcggc cagtcgcgtt cgcggcgtt 300  
ccaaatcacac ctcacatcaccg cggccacgt gtcgcacggcc ctggcccttc cgcctcccg 360  
cgccaaacggc gacggcgatg gcccggcaagg tgcggggccg cagccgtctc cggacgtcgc 420  
ggctcagccg cccggagggtt tgctgacgtt ggcgtcggtt gcccgttca agctggcgta 480  
cgtgcgtgtt acgcgcgcgtt tccggagggtt gtacgacgc acgaaggccg tggatgtgc 540  
cttccgcctc accttcgcgg ccagttgggtt gcaaggcccgcc gccgtatgtt atggcctgccc 600  
cgccgcacatc gtggccctgg cgctgcctt gacgttggac aagatgtgtt cggccgggtt 660  
gatccgcggcc gactggcgca ggcgcctaccc ggcagccaggc gtgggtgc gacaccacgt 720  
ggcgttcgtt gtcgcggccagg gcaaccccaa gaacatccgc acctggagg acctcacgcg 780  
ggcgggtgtt gaggtgtgtt tggccaaaccc caagaccgcg gtagtggcca ggtggatctt 840

cctggccctg tggggcgcca agatgaagaa gggcaacgcc gcccgcgtgg cgtatgtgca 900  
 gcgcgtgttc gagaacgtgg tggtgcagcc gcgtgtatgcg cgccgaggcgt cggacgtgtt 960  
 ctataagcag aaggtggcg acgtgtgtt gacgtacgag aacgaggtga tcctgaccac 1020  
 cgaggtgtac ggcgacaagg cgctgccgtc cctgggtgccc tcctacaaca tccgcacatcga 1080  
 gtgcccgtg ggcgtgggtt acaagggtgtt ggatgcccgc ggccccggg tgccgcgaggc 1140  
 ggcgtccgag ttctgcccgtt tcctgttac gcccgcggcg cagcacgagt tcgcgcggct 1200  
 gggctccgc gtgaaccgcg gcacctgcaa ggaggtggcg gcgcacgaga ccggactgccc 1260  
 gcccgc当地 ctgtggcagg tggacaaggg gctgggcggc tgggtgcgg cccagaagaa 1320  
 gttttcgac gctggcgcca tccttgcgca catccagttcc gccgtggca agctgcgtgt 1380  
 ggagcagcgc aaggcggcgc aggccggc caggccgttag agagacgcgg tacaagtgt 1440  
 cgggtgtca gcaggagctg cagcaggggc agcaagaggg ctttgcacagg agggaatgg 1500  
 aggcaaaaggc ggcaggggag gcgggatggc gggatgaagt gaggggtgtc aagcagcgt 1560  
 gtgtgccaag gacgggtgtcg gcgtatgtaca tgataacatg aggagacagg agcatctcct 1620  
 ggcaggaggc ggc当地 accgtg gagtgtctga aaggagaact tgattgtca gtgtgggaca 1680  
 gataacggag ggc当地 gggtgtt ggggctgtt gcttatcgtt gtgttctat ggggaggcct 1740  
 gactgcattt gggcgcacgt agtgtatgg ccgtacacg cttgtcgaa actgacataa 1800  
 acaggcggttc aggccatggc tgcattgaggc ttgtatgtcgt atcgcggact gtc 1853

<210> 7

<211> 369

<212> PRT

<213> Chlamydomonas reinhardtii

<400> 7

Met	Ala	Ser	Thr	Thr	Leu	Leu	Gln	Pro	Ala	Leu	Gly	Leu	Pro	Ser	Arg
1					5				10				15		
Val	Gly	Pro	Arg	Ser	Pro	Leu	Ser	Leu	Pro	Lys	Ile	Pro	Arg	Val	Cys
						20			25			30			
Thr	His	Thr	Ser	Ala	Pro	Ser	Thr	Ser	Lys	Tyr	Cys	Asp	Ser	Ser	Ser
						35			40			45			
Val	Ile	Glu	Ser	Thr	Leu	Gly	Arg	Gln	Thr	Ser	Val	Ala	Gly	Arg	Pro
						50			55			60			
Trp	Leu	Ala	Pro	Arg	Pro	Ala	Pro	Gln	Gln	Ser	Arg	Gly	Asp	Leu	Leu
						65			70			75		80	
Val	Ser	Lys	Ser	Gly	Ala	Ala	Gly	Gly	Met	Gly	Ala	His	Gly	Gly	
						85			90			95			
Leu	Gly	Glu	Pro	Val	Asp	Asn	Trp	Ile	Lys	Lys	Leu	Leu	Val	Gly	Val
						100			105			110			
Ala	Ala	Ala	Tyr	Ile	Gly	Leu	Val	Val	Leu	Val	Pro	Phe	Leu	Asn	Val
						115			120			125			
Phe	Val	Gln	Ala	Phe	Ala	Lys	Gly	Ile	Ile	Pro	Phe	Leu	Glu	His	Cys
						130			135			140			
Ala	Asp	Pro	Asp	Phe	Leu	His	Ala	Leu	Lys	Met	Thr	Leu	Met	Leu	Ala
						145			150			155		160	
Phe	Val	Thr	Val	Pro	Leu	Asn	Thr	Val	Phe	Gly	Thr	Val	Ala	Ala	Ile
						165			170			175			
Asn	Leu	Thr	Arg	Asn	Glu	Phe	Pro	Gly	Lys	Val	Phe	Leu	Met	Ser	Leu
						180			185			190			
Leu	Asp	Leu	Pro	Phe	Ser	Ile	Ser	Pro	Val	Val	Thr	Gly	Leu	Met	Leu
						195			200			205			
Thr	Leu	Leu	Tyr	Gly	Arg	Thr	Gly	Trp	Phe	Ala	Ala	Leu	Leu	Arg	Glu
						210			215			220			
Thr	Gly	Ile	Asn	Val	Val	Phe	Ala	Phe	Thr	Gly	Met	Ala	Leu	Ala	Thr
						225			230			235		240	
Met	Phe	Val	Thr	Leu	Pro	Phe	Val	Val	Arg	Glu	Leu	Ile	Pro	Ile	Leu
						245			250			255			
Glu	Asn	Met	Asp	Leu	Ser	Gln	Glu	Glu	Ala	Ala	Arg	Thr	Leu	Gly	Ala
						260			265			270			
Asn	Asp	Trp	Gln	Val	Phe	Trp	Asn	Val	Thr	Leu	Pro	Asn	Ile	Arg	Trp
						275			280			285			
Gly	Leu	Leu	Tyr	Gly	Val	Ile	Leu	Cys	Asn	Ala	Arg	Ala	Met	Gly	Glu

290	295	300
Phe	Gly	Ala Val Ser Val Ile Ser Gly Asn Ile Ile Gly Arg Thr Gln
305		310 315 320
Thr	Leu	Thr Leu Phe Val Glu Ser Ala Tyr Lys Glu Tyr Asn Thr Glu
		325 330 335
Ala	Ala	Phe Ala Ala Ala Val Leu Leu Ser Ala Leu Ala Leu Gly Thr
		340 345 350
Leu	Trp	Ile Lys Asp Lys Val Glu Glu Ala Ala Ala Ala Glu Ser Arg
		355 360 365
Lys		

<210> 8  
<211> 465  
<212> PRT  
<213> Chlamydomonas reinhardtii

<220>  
<221> VARIANT  
<222> 438  
<223> Xaa = Any Amino Acid

<400> 8		
Met	Ala	Ser Leu Leu Ala Gln Thr Thr Ser Arg Leu Gly Ala Arg Pro
1		5 10 15
Ala	Ala	Gln Ala Gly Pro Val Ala Gln Met Ala Pro Met Ala Ser Arg
		20 25 30
Val	Gln	Pro Ala Met Pro Ser Ala Leu Leu Pro Leu His Ala Arg Ala
		35 40 45
Thr	Thr	Thr Ser Val Ala Cys Arg Ala Ala Ser Ile Asp Lys Pro Val
		50 55 60
Val	Tyr	Thr Pro Arg Asp Ser Ser Gln Gln Ser Ser Asn Gly Ala Gly
65		70 75 80
Glu	Val	Ser Met Ser, Ile Ser Ser Met Asp Glu Val Gly Pro Ser Tyr
		85 90 95
Glu	Gly	Ile Ile Thr Asp Ala Pro Thr Arg Pro Thr Gly Leu Tyr Val
		100 105 110
Arg	Val	Arg Asn Met Val Lys His Phe Ser Thr Ala Lys Gly Leu Phe
		115 120 125
Arg	Ala	Val Asp Gly Val Asp Val Asp Ile Glu Pro Ser Ser Ile Val
		130 135 140
Ala	Leu	Leu Gly Pro Ser Gly Ser Gly Lys Thr Thr Leu Leu Arg Leu
145		150 155 160
Ile	Ala	Gly Leu Glu Gln Pro Thr Gly Gly Asn Ile Tyr Phe Asp Asp
		165 170 175
Thr	Asp	Ala Thr Asn Leu Ser Val Gln Asp Arg Gln Ile Gly Phe Val
		180 185 190
Phe	Gln	Ser Tyr Ala Leu Phe Asn His Lys Thr Val Ala Glu Asn Ile
		195 200 205
Lys	Phe	Gly Leu Glu Val Arg Lys Leu Asn Ile Asp His Asp Lys Arg
		210 215 220
Val	Ala	Glu Leu Leu Ala Leu Val Gln Leu Thr Gly Leu Gly Asp Arg
225		230 235 240
Tyr	Pro	Arg Gln Leu Ser Gly Gly Gln Arg Gln Arg Val Ala Leu Ala
		245 250 255
Arg	Ala	Leu Ala Ser Asn Pro Arg Leu Leu Leu Asp Glu Pro Phe
		260 265 270
Gly	Ala	Leu Asp Ala Val Val Arg Lys Gln Leu Arg Thr Gly Leu Arg
		275 280 285
Glu	Ile	Val Arg Ser Val Gly Val Thr Thr Ile Ile Val Thr His Asp

290	295	300				
Gln	Glu	Glu Ala Phe Asp	Leu	Ala Asp Lys	Val	Val Val Phe Asn Arg
305		310		315		320
Gly	Leu	Val Glu Gln Gln Gly Ser	Pro	Thr Glu Ile Ile Lys	Arg	Pro
		325		330		335
Arg	Thr	Pro Phe Ile Met Lys Phe	Val	Gly Glu Thr Asn Val	Val	Pro
		340		345		350
Ala	Thr	Ser Leu Leu Ala Lys	Arg	Met Arg Phe Asn	Thr	Ser Lys Thr
		355		360		365
Ser	Val	Met Phe Arg Pro His	Asp Ile Lys	Leu Phe Lys	Thr Val	Pro
		370		375		380
Pro	Glu	Ser Gly Glu Gly Ala	Leu Thr Thr	Val Gly Ala Asn	Val	Ala
		385		390		395
Asp	Lys	Ala Asn Leu Gly Trp	Val Val Lys	Tyr Thr Leu Arg	Phe Asp	
		405		410		415
Asp	Asp	Val Glu Cys Glu	Leu Gln Leu	Ser Arg Asp Gln	Asp Glu Arg	
		420		425		430
Glu	Tyr	Asn Leu Val Xaa Gly Ser	Arg Val Phe	Val His Val	Pro His	
		435		440		445
Arg	Thr	Met Met Gly Phe Asn Ala	Ser Asp Val	Asp Ser Thr	Pro Ile	
		450		455		460
Val						
465						

<210> 9  
<211> 467  
<212> PRT  
<213> Chlamydomonas reinhardtii

<400> 9						
Met	Ser	Phe Leu Ala Pro Ser	Leu Gly Val	Ala Arg Gly Ile	Leu Glu	
1		5		10		15
Pro	Ala	Ser Ala Ala Arg	Pro Pro Ala	His Ala Ala Gly	His Ala Pro	
		20		25		30
Val	Leu	Thr Ser Asp Arg	Thr Gly Gly	Pro Ala Ala Asn	His Asp Arg	
		35		40		45
Pro	Ala	Gly Ala Pro Ser	Pro His Ala Ala	Ser Leu Thr	Pro Ser Ser	
		50		55		60
Ser	Gly	Gln Ala Ser Gln	Gln Gly Asp	Pro Gln Arg	Ser Gln His Gln	
		65		70		75
Gln	Ala	Gln Arg Gln Asp	Gln Gln Ser	Gln Ser Arg	Ser Leu Gln	
		85		90		95
Ser	His	Leu Ile Thr Ala Ala	Thr Leu Leu	Pro Ala Leu	Pro Pro Pro	
		100		105		110
Pro	Pro	Gly Gly Asn Gly Asp	Gly Asp Gly	Gly Glu Ala Ala	Gly Pro	
		115		120		125
Gln	Pro	Leu Ala Asp Val	Ala Ala Gln	Pro Pro Glu	Val Val Leu Thr	
		130		135		140
Leu	Ala	Ser Phe Ala Val	Thr Lys Leu	Ala Tyr Val	Arg Val Thr Arg	
		145		150		155
Ala	Phe	Arg Glu Trp Tyr	Glu Arg Thr	Lys Gly Val	Asp Val Arg Phe	
		165		170		175
Arg	Leu	Thr Phe Ala Ala Ser	Gly Val Gln	Ala Arg Ala Val	Ile Asp	
		180		185		190
Gly	Leu	Pro Ala Asp Ile Val	Ala Leu Ala	Leu Pro Leu	Asp Leu Asp	
		195		200		205
Lys	Ile	Val Ser Ala Gly	Leu Ile Arg	Pro Asp Trp	Arg Ser Ala Tyr	
		210		215		220
Pro	Ala	Ala Ser Val Val Cys	Glu Thr Thr	Val Ala Phe	Val Val Arg	
		225		230		235
						240

Gln Gly Asn Pro Lys Asn Ile Arg Thr Trp Glu Asp Leu Thr Arg Ala  
                  245                 250                 255  
 Gly Val Glu Val Val Leu Ala Asn Pro Lys Thr Ala Gly Val Ala Arg  
                  260                 265                 270  
 Trp Ile Phe Leu Ala Leu Trp Gly Ala Lys Met Lys Lys Gly Asn Ala  
                  275                 280                 285  
 Ala Ala Leu Ala Tyr Val Gln Arg Val Phe Glu Asn Val Val Val Gln  
                  290                 295                 300  
 Pro Arg Asp Ala Arg Glu Ala Ser Asp Val Phe Tyr Lys Gln Lys Val  
                  305                 310                 315                 320  
 Gly Asp Val Leu Leu Thr Tyr Glu Asn Glu Val Ile Leu Thr Asn Glu  
                  325                 330                 335  
 Val Tyr Gly Asp Ala Leu Pro Tyr Leu Val Pro Ser Tyr Asn Ile  
                  340                 345                 350  
 Arg Ile Glu Cys Pro Leu Ala Leu Val Asp Lys Val Val Asp Ala Arg  
                  355                 360                 365  
 Gly Pro Glu Val Arg Glu Ala Ala Ser Glu Phe Cys Arg Phe Leu Phe  
                  370                 375                 380  
 Thr Pro Ala Ala Gln His Glu Phe Ala Arg Leu Gly Phe Arg Val Asn  
                  385                 390                 395                 400  
 Pro Arg Thr Cys Lys Glu Val Ala Ala Gln Gln Thr Gly Leu Pro Pro  
                  405                 410                 415  
 Ala Asn Leu Trp Gln Val Asp Lys Glu Leu Gly Gly Trp Ala Ala Ala  
                  420                 425                 430  
 Gln Lys Lys Phe Phe Asp Ala Gly Ala Ile Leu Asp Asp Ile Gln Ser  
                  435                 440                 445  
 Ala Val Gly Lys Leu Arg Val Glu Gln Arg Lys Ala Ala Gln Ala Ala  
                  450                 455                 460  
 Ala Arg Arg  
         465

<210> 10  
 <211> 284  
 <212> PRT  
 <213> N. olivacea

<400> 10

Met	Phe	Asp	Pro	Lys	Ser	Leu	Asp	Ser	Gly	Ser	Arg	Ser	Ile	Leu	Thr
1															
															15
Met	Lys	Asn	Arg	Leu	Val	Ser	Trp	Ala	Trp	Ala	Leu	Thr	Leu	Met	Tyr
															30
Met	Leu	Val	Ser	Leu	Ile	Leu	Pro	Ile	Gly	Ala	Leu	Leu	Gln	Lys	Ser
															45
Ser	Gln	Glu	Ser	Val	Ser	Glu	Phe	Val	Ser	Ile	Ala	Thr	Ala	Pro	Val
															50
Ala	Met	Ser	Ala	Tyr	Ala	Val	Thr	Leu	Ser	Ser	Ala	Leu	Ile	Ala	Ala
															65
Leu	Leu	Asn	Gly	Val	Phe	Gly	Leu	Leu	Ile	Ala	Trp	Val	Leu	Val	Arg
															85
Tyr	Glu	Phe	Pro	Gly	Arg	Arg	Leu	Leu	Asp	Ala	Ala	Val	Asp	Leu	Pro
															100
Phe	Ala	Leu	Pro	Thr	Ser	Val	Ala	Gly	Leu	Thr	Leu	Ala	Thr	Val	Tyr
															115
Ser	Asp	Gln	Gly	Trp	Ile	Gly	Thr	Trp	Leu	Ser	Ser	Leu	Asn	Ile	Gln
															130
Val	Ala	Phe	Thr	Arg	Leu	Gly	Val	Met	Leu	Ala	Met	Leu	Phe	Val	Ser
															145
Phe	Pro	Phe	Val	Val	Arg	Thr	Leu	Gln	Pro	Val	Leu	Gln	Asp	Met	Glu
															165
Arg	Glu	Leu	Glu	Glu	Ala	Ala	Trp	Ser	Leu	Gly	Ala	Ser	Pro	Phe	Asn
															180
															185
															190

Thr	Phe	Leu	Arg	Val	Leu	Cys	Pro	Pro	Leu	Met	Pro	Ala	Met	Met	Thr
							195		200			205			
Gly	Ile	Ala	Leu	Ala	Phe	Ser	Arg	Ala	Val	Gly	Glu	Tyr	Gly	Ser	Val
							210		215			220			
Val	Ile	Val	Ser	Gly	Asn	Ile	Pro	Phe	Gln	Asp	Leu	Ile	Ala	Pro	Val
							225		230			235			240
Leu	Ile	Phe	Gln	Arg	Leu	Glu	Gln	Tyr	Asp	Tyr	Ser	Gly	Ala	Thr	Val
							245		250			255			
Ile	Gly	Thr	Val	Val	Leu	Leu	Ile	Ser	Leu	Thr	Leu	Leu	Leu	Ala	Ile
							260		265			270			
Asn	Trp	Ile	Gln	Ala	Ser	Asn	Arg	Lys	Phe	Leu	Gly				
							275		280						

<210> 11  
<211> 269  
<212> PRT  
<213> M. viride

<400>	11														
Met	Asn	Tyr	Phe	Ser	Lys	Leu	Ser	Cys	Ser	Trp	Arg	Ile	Thr	Leu	Gly
						1		5			10			15	
Tyr	Leu	Leu	Phe	Met	Leu	Ile	Leu	Pro	Ile	Leu	Ala	Leu	Ser	Arg	
						20			25			30			
Ala	Ser	Gln	Glu	Leu	Phe	Ser	Asn	Phe	Trp	Ser	Ile	Ala	Met	Glu	Pro
						35			40			45			
Ala	Ala	Ile	Tyr	Ala	Tyr	Ser	Ile	Thr	Leu	Ser	Met	Ala	Leu	Ile	Ala
						50			55			60			
Ser	Ile	Val	Asn	Gly	Ile	Phe	Gly	Ile	Phe	Ile	Ala	Trp	Ile	Leu	Val
						65			70			75			80
Arg	Tyr	Asn	Phe	Pro	Gly	Lys	Arg	Ile	Val	Asp	Ala	Ala	Ile	Asp	Leu
						85			90			95			
Pro	Phe	Ala	Leu	Pro	Thr	Ser	Val	Ala	Gly	Leu	Thr	Leu	Ala	Thr	Val
						100			105			110			
Tyr	Ser	Glu	Lys	Gly	Trp	Ile	Gly	His	Phe	Leu	Gln	Ser	Leu	Ser	Ile
						115			120			125			
Lys	Val	Val	Phe	Thr	Lys	Leu	Gly	Val	Gly	Val	Ala	Met	Ile	Phe	Val
						130			135			140			
Ser	Phe	Pro	Phe	Val	Val	Arg	Thr	Leu	Gln	Pro	Val	Leu	Gln	Asp	Ile
						145			150			155			160
Glu	Lys	Glu	Leu	Glu	Glu	Ala	Ala	Trp	Ser	Leu	Gly	Ala	Ser	Ser	Trp
						165			170			175			
Thr	Thr	Phe	Trp	Lys	Val	Ile	Phe	Pro	Ser	Leu	Ile	Pro	Ser	Leu	Leu
						180			185			190			
Thr	Gly	Ile	Ala	Leu	Ala	Phe	Ser	Arg	Ala	Val	Gly	Glu	Tyr	Gly	Ser
						195			200			205			
Val	Val	Ile	Ile	Ala	Ser	Asn	Ile	Pro	Phe	Lys	Asp	Leu	Thr	Ala	Pro
						210			215			220			
Val	Leu	Ile	Phe	Gln	Lys	Leu	Glu	Gln	Tyr	Asp	Tyr	Thr	Gly	Ala	Thr
						225			230			235			240
Val	Ile	Gly	Thr	Val	Ile	Leu	Ser	Ile	Ser	Leu	Phe	Ile	Leu	Val	Gly
						245			250			255			
Ile	Asn	Ile	Ile	Gln	Ser	Leu	Asn	Gln	Met	Tyr	Ser	Lys			
						260			265						

<210> 12  
<211> 411  
<212> PRT  
<213> C. reinhardtii

<400> 12

Met	Glu	Arg	Val	Cys	Ser	His	Gln	Leu	Ala	Ser	Ser	Arg	Gly	Arg	Pro
1	5						10						15		
Cys	Ile	Ala	Gly	Val	Gln	Arg	Ser	Pro	Ile	Arg	Leu	Gly	Thr	Ser	Ser
	20						25						30		
Val	Ala	His	Val	Gln	Val	Ser	Pro	Ala	Gly	Leu	Gly	Arg	Tyr	Gln	Arg
	35					40						45			
Gln	Arg	Leu	Gln	Val	Val	Ala	Ser	Ala	Ala	Ala	Ala	Ala	Phe	Asp	
	50					55						60			
Pro	Pro	Gly	Gly	Val	Ser	Ala	Gly	Phe	Ser	Gln	Pro	Gln	Gln	Gln	Leu
65				70					75					80	
Pro	Gln	Gln	His	Pro	Arg	Gln	Pro	Gln	Ala	Val	Ala	Glu	Val	Ala	Val
					85				90					95	
Ala	Glu	Ser	Val	Ser	Ala	Pro	Ala	Ser	Ala	Ala	Pro	Ser	Asn	Asp	Gly
	100						105						110		
Ser	Pro	Thr	Ala	Ser	Met	Asp	Gly	Gly	Pro	Ser	Ser	Gly	Leu	Ser	Ala
	115						120						125		
Val	Pro	Ala	Ala	Ala	Thr	Ala	Thr	Asp	Leu	Phe	Ser	Ala	Ala	Ala	Arg
	130						135						140		
Leu	Arg	Leu	Pro	Asn	Leu	Ser	Pro	Ile	Ile	Thr	Trp	Thr	Phe	Met	Leu
145					150					155				160	
Ser	Tyr	Met	Ala	Phe	Met	Leu	Ile	Met	Pro	Ile	Thr	Ala	Leu	Leu	Gln
					165					170				175	
Lys	Ala	Ser	Leu	Val	Pro	Leu	Asn	Val	Phe	Ile	Ala	Arg	Ala	Thr	Glu
					180				185					190	
Pro	Val	Ala	Met	His	Ala	Tyr	Tyr	Val	Thr	Phe	Ser	Cys	Ser	Leu	Ile
					195			200				205			
Ala	Ala	Ala	Ile	Asn	Cys	Val	Phe	Gly	Phe	Val	Leu	Ala	Trp	Val	Leu
	210					215						220			
Val	Arg	Tyr	Asn	Phe	Ala	Gly	Lys	Ile	Leu	Asp	Ala	Ala	Val	Asp	
225					230				235					240	
Leu	Pro	Phe	Ala	Leu	Pro	Thr	Ser	Val	Ala	Gly	Leu	Thr	Leu	Ala	Thr
					245				250					255	
Val	Tyr	Gly	Asp	Glu	Phe	Phe	Ile	Gly	Gln	Phe	Leu	Gln	Ala	Gln	Gly
					260			265					270		
Val	Gln	Val	Val	Phe	Thr	Arg	Leu	Gly	Val	Val	Ile	Ala	Met	Ile	Phe
					275			280					285		
Val	Ser	Phe	Pro	Phe	Val	Val	Arg	Thr	Met	Gln	Pro	Val	Met	Gln	Glu
					290			295					300		
Ile	Gln	Lys	Glu	Met	Glu	Glu	Ala	Ala	Trp	Ser	Leu	Gly	Ala	Ser	Gln
305						310				315				320	
Trp	Arg	Thr	Phe	Thr	Asp	Val	Val	Leu	Pro	Pro	Leu	Leu	Pro	Ala	Leu
					325				330					335	
Leu	Thr	Gly	Thr	Ala	Leu	Ala	Phe	Ser	Arg	Ala	Leu	Gly	Glu	Phe	Gly
					340			345					350		
Ser	Ile	Val	Ile	Val	Ser	Ser	Asn	Phe	Ala	Phe	Lys	Asp	Leu	Ile	Ala
					355			360					365		
Pro	Val	Leu	Ile	Phe	Gln	Cys	Leu	Glu	Gln	Tyr	Asp	Tyr	Val	Gly	Ala
					370			375					380		
Thr	Val	Ile	Gly	Thr	Val	Leu	Leu	Leu	Ile	Ser	Leu	Val	Met	Met	Leu
385						390				395				400	
Ala	Val	Asn	Gln	Leu	Gln	Lys	Leu	Ala	Arg	Lys					
					405				410						

<210> 13  
<211> 266  
<212> PRT  
<213> C. vulgaris

<400> 13

Met Lys Arg Tyr Pro Thr Phe Ile Lys Asn Ser Ile Leu Leu Phe Tyr  
 1 5 10 15  
 Phe Phe Phe Leu Leu Ile Leu Pro Val Val Val Leu Phe Leu Leu Ile  
 20 25 30  
 Phe Gln Asn Asn Trp His Glu Val Leu Arg Lys Ala Thr Asp Pro Ile  
 35 40 45  
 Ala Val Ser Ala Tyr Leu Leu Thr Val Gln Met Ala Phe Tyr Ala Ala  
 50 55 60  
 Leu Val Asn Ser Ile Phe Gly Phe Ile Ile Thr Trp Val Leu Thr Arg  
 65 70 75 80  
 Tyr Gln Phe Trp Gly Arg Glu Phe Leu Asp Ala Ala Val Asp Leu Pro  
 85 90 95  
 Phe Ala Leu Pro Thr Ser Val Ala Gly Leu Thr Leu Ala Thr Val Tyr  
 100 105 110  
 Gly Asp Gln Gly Trp Ile Gly Ser Leu Phe Asn Leu Phe Gly Phe Gln  
 115 120 125  
 Ile Val Phe Thr Lys Ile Gly Val Leu Leu Ala Met Ile Phe Val Ser  
 130 135 140  
 Phe Pro Phe Val Ile Arg Thr Leu Gln Pro Val Leu Gln Glu Met Glu  
 145 150 155 160  
 Lys Ser Leu Glu Glu Ala Ala Trp Ser Leu Gly Ala Ser Ser Trp Glu  
 165 170 175  
 Thr Phe Arg Lys Val Ile Leu Pro Thr Leu Trp Pro Ala Leu Phe Thr  
 180 185 190  
 Gly Phe Thr Leu Ser Phe Ser Arg Ala Leu Gly Glu Phe Gly Ser Ile  
 195 200 205  
 Val Met Ile Ser Ser Asn Leu Pro Phe Lys Asp Leu Val Ala Ser Val  
 210 215 220  
 Leu Ile Tyr Gln Ser Leu Glu Gln Tyr Asp Tyr Leu Gly Ala Ser Val  
 225 230 235 240  
 Ile Gly Ala Val Val Leu Leu Ile Ala Leu Phe Thr Leu Leu Leu Ile  
 245 250 255  
 Asn Ala Phe Gln Ile Met Lys Phe Arg Val  
 260 265

<210> 14

<211> 278

<212> PRT

<213> Synechococcus sp. PCC 7942

<400> 14

Met Ser Leu Arg Leu Pro Ser Leu Ser Phe Thr Trp Leu Thr Arg Leu  
 1 5 10 15  
 Ser Trp Ser Trp Arg Phe Thr Trp Val Tyr Leu Thr Leu Ile Leu Phe  
 20 25 30  
 Ile Pro Ile Ile Ala Leu Phe Leu Lys Ser Ala Ser Leu Pro Leu Gly  
 35 40 45  
 Arg Ile Trp Glu Leu Ala Thr Gln Pro Val Ala Val Ala Ala Tyr Glu  
 50 55 60  
 Val Thr Phe Gly Leu Ser Leu Ala Ala Ala Leu Asn Gly Val Phe  
 65 70 75 80  
 Gly Val Ile Ile Ala Trp Val Leu Thr Arg Tyr Asp Phe Pro Gly Lys  
 85 90 95  
 Lys Leu Phe Asp Ser Phe Ile Asp Leu Pro Phe Ala Leu Pro Thr Ala  
 100 105 110  
 Val Ala Gly Leu Thr Leu Ala Thr Val Tyr Ser Asp Lys Gly Trp Ile  
 115 120 125  
 Gly Gln Phe Ile Ala Pro Phe Gly Val Gln Ile Ala Phe Thr Arg Trp  
 130 135 140  
 Gly Val Leu Leu Ala Met Val Phe Ile Ser Leu Pro Phe Val Val Arg

145	150	155	160
Thr Val Glu Pro Leu Leu Leu Glu Leu Glu Val Glu Ala Glu Glu Ala			
165	170	175	
Ala Ala Ser Leu Gly Ala Ser Pro Ser Glu Thr Phe Trp Arg Val Ile			
180	185	190	
Leu Pro Pro Ile Leu Pro Gly Val Leu Ala Gly Val Ala Gln Gly Phe			
195	200	205	
Ser Arg Ala Val Gly Glu Phe Gly Ser Val Val Ile Ile Ser Gly Asn			
210	215	220	
Leu Pro Phe Asp Asp Leu Ile Ala Pro Val Leu Ile Phe Glu Arg Leu			
225	230	235	240
Glu Gln Tyr Asp Tyr Ala Gly Ala Thr Val Ile Gly Ser Val Leu Leu			
245	250	255	
Leu Phe Ser Leu Val Ile Leu Phe Val Ile Asn Ala Leu Gln Asn Trp			
260	265	270	
Ser Ser Arg Tyr Asn Gly			
275			

<210> 15  
<211> 288  
<212> PRT  
<213> M. polymorpha

<400> 15			
Met Ile Pro Leu Phe Phe Ile Pro Pro Phe Ile Ile Leu Phe Ile Thr			
1	5	10	15
Lys Gly Lys Phe Arg Phe Leu Thr Lys Phe Glu Leu Val Leu Ala Cys			
20	25	30	
Ala Leu His Tyr Gly Thr Phe Ile Leu Ala Leu Pro Ile Phe Phe Leu			
35	40	45	
Leu Tyr Lys Thr Lys Gln Gln Pro Trp Asn Ile Leu Leu Gln Thr Ala			
50	55	60	
Leu Glu Pro Val Val Leu Ser Ala Tyr Gly Phe Thr Phe Leu Thr Ala			
65	70	75	80
Leu Leu Ala Thr Ile Ile Asn Ala Ile Phe Gly Leu Ile Leu Ala Trp			
85	90	95	
Val Leu Val Arg Tyr Glu Phe Pro Gly Lys Lys Leu Leu Asp Ala Thr			
100	105	110	
Val Asp Leu Pro Phe Ala Leu Pro Thr Ser Val Gly Gly Leu Thr Leu			
115	120	125	
Met Thr Val Phe Asn Asp Lys Gly Trp Ile Lys Pro Ile Cys Ser Trp			
130	135	140	
Leu Asn Ile Lys Ile Val Phe Asn Pro Ile Gly Val Leu Leu Ala Met			
145	150	155	160
Ile Phe Val Ser Leu Pro Phe Val Val Arg Thr Ile Gln Pro Val Leu			
165	170	175	
Gln Asn Met Glu Glu Asp Leu Glu Glu Ala Ala Trp Cys Leu Gly Ala			
180	185	190	
Ser Pro Trp Thr Thr Phe Trp His Ile Leu Phe Pro Pro Leu Thr Pro			
195	200	205	
Ser Leu Leu Thr Gly Thr Thr Leu Gly Phe Ser Arg Ala Leu Gly Glu			
210	215	220	
Tyr Gly Ser Ile Val Leu Ile Ala Ser Asn Ile Pro Met Lys Asp Leu			
225	230	235	240
Val Ile Ser Val Leu Leu Phe Gln Lys Leu Glu Gln Tyr Asp Tyr Lys			
245	250	255	
Ser Ala Thr Ile Ile Ala Ser Phe Val Leu Ile Ile Ser Phe Thr Ala			
260	265	270	
Leu Phe Phe Ile Asn Lys Ile Gln Leu Trp Lys Lys Thr Phe His Lys			
275	280	285	

<210> 16  
<211> 279  
<212> PRT  
<213> B. halodurans

<400> 16  
Met Lys Ser Val Arg Ser Trp Lys Asn His Asn Ile Leu Pro Gly Phe  
1 5 10 15  
Gly Leu Ser Leu Gly Phe Thr Met Met Tyr Leu Gly Ile Leu Val Leu  
20 25 30  
Leu Pro Leu Ser Met Val Phe Ile Asn Thr Ser Ser Met Gly Trp Gln  
35 40 45  
Ala Phe Trp Gln Ala Ile Thr Glu Pro Arg Val Leu Ala Ser Tyr Arg  
50 55 60  
Leu Ser Phe Gly Ala Ala Ile Ile Ala Ala Ser Ile Asn Ala Val Phe  
65 70 75 80  
Gly Leu Leu Ile Ala Trp Val Leu Val Arg Tyr His Phe Pro Gly Lys  
85 90 95  
Arg Ile Ile Asp Gly Leu Val Asp Leu Pro Phe Ala Leu Pro Thr Ala  
100 105 110  
Val Ala Gly Ile Ala Leu Thr Thr Leu Tyr Thr Thr Asn Gly Trp Ile  
115 120 125  
Gly Gln Tyr Leu Glu Val Phe Gly Ile Arg Ile Ala Phe Thr Pro Leu  
130 135 140  
Gly Val Ile Val Ala Leu Thr Phe Ile Gly Leu Pro Phe Val Val Arg  
145 150 155 160  
Met Val Gln Pro Val Leu Gln Gly Ile Glu Lys Glu Leu Glu Ala  
165 170 175  
Ser Ala Cys Leu Gly Ala Asn Arg Leu Gln Thr Phe Ser Lys Ile Ile  
180 185 190  
Phe Pro Thr Val Leu Pro Ala Leu Leu Thr Gly Phe Ala Leu Ala Phe  
195 200 205  
Ala Arg Ala Leu Gly Glu Tyr Gly Ser Val Val Phe Ile Ser Gly Asn  
210 215 220  
Leu Pro Met Gln Thr Glu Ile Thr Pro Leu Leu Ile Met Thr Lys Leu  
225 230 235 240  
Glu Gln Phe Asp Tyr Ala Gly Ala Thr Ala Leu Ala Ala Val Met Leu  
245 250 255  
Ile Ile Ser Phe Phe Met Leu Leu Phe Ile Asn Ile Leu Gln Trp Trp  
260 265 270  
Ser Gln Arg Arg Gln Leu Ser  
275